Space Weather Forecast

Issued on Tuesday 1 October 2024 at 01:18 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class flares. Chance of G1-G2/Minor-Moderate Geomagnetic storms day 1.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity is Moderate with just one Moderate class flare at the end of the period.

There are currently ten sunspot regions on the visible disc. The most notable remains a large spot in the southeast quadrant, which continues to show minor growth in its intermediate spots and significant magnetic complexity. The other spots are simple and benign, though some have shown some growth and will need to be carefully monitored.

A CME observed leaving the Sun around 30/1545UTC may give a glancing blow on day 3 (03 Oct).

Solar Wind / Geomagnetic Activity: Solar wind parameters were indicative of a weak coronal hole fast wind. Speeds started at slightly elevated levels but have slowly eased through the period. Interplanetary Magnetic Field was briefly moderate before easing to background levels. The north-south component started at moderate levels but soon eased back to background levels. Geomagnetic activity was mostly Quiet (Kp1-2), with one Unsettled (Kp3) interval (30/0000-0300UTC).

Energetic Particles / Solar Radiation: The count rate of energetic particles remained at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is expected, with a chance of further isolated Moderate class flares. There is a very slight chance of a Strong flare from the complex sunspot region located in the southeast.

Solar Wind / Geomagnetic Activity: A coronal mass ejection which left the Sun from the southwest quadrant on 29/0544 UTC has been reanalysed with possible glancing impacts at Earth any time from early day 1 (01 Oct) until early day 2 (02 Oct). A further CME from the 30th may give a glancing blow on day 3 (03 Oct). In the absence of any CME influences Solar winds are likely to return to background levels on day 1 (01 Oct).

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Mainly Quiet (Kp 0-2) geomagnetic conditions are expected initially, with a chance of Unsettled to Active (Kp 3-4) intervals due to the waning coronal hole fast wind environment. There is then a chance of G1-G2/Minor-Moderate geomagnetic storms occurring day 1 (01 Oct) due to the glancing arrival of the 29 Sep coronal mass ejection, this risk continuing but reducing into day 3 (03 Oct) with the possibility of further CME glancing blows. Confidence becomes lower by day 4 (04 Oct) due to the number of filaments currently on the disc.

Energetic Particles / Solar Radiation: The count rate of energetic particles is forecast to persist at background levels, with no solar radiation storms expected.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	20	20	10
Strong	G3	No	1	1	1	0
Severe	G4	No	1	1	1	0
Extreme	G5	No	1	1	1	0

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	60	50	50	50
Very Active	R3-R5 (X Class)	No	10	10	10	10

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	15	15	15
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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